

## ABSTRACT OF THE DISCLOSURE

In a method of enzyme-catalyzed isotope labeling of peptides, peptides are formed from proteins digested by proteolytic enzymes selected from trypsin, chymotrypsin, Lys-C endoprotease, Glu-C endoprotease, an endoprotease that cleaves at the C-terminal side of an amino acid residue on a protein, or a mixture of two or more of these proteolytic enzymes. Thereafter isotopic atoms are incorporated into the peptides in the catalytic presence of proteolytic enzymes selected from trypsin, chymotrypsin, Lys-C endoprotease, Glu-C endoprotease, an endoprotease that cleaves at the C-terminal side of an amino acid residue on a protein, or a mixture of two or more of these proteolytic enzymes.